SIMULATION RESULTS FOR NEURNAL RNN NETWORK

Table A.1 First group - RNN results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	8041.010	6184.416	0.03766	4.294
4	1	1	4,1,1	7745.429	5885.487	0.03556	4.243
8	1	1	8,1,1	7698.151	5879.583	0.03587	4.413
16	1	1	16,1,1	7498.964	5757.861	0.03570	4.816
32	1	1	32,1,1	8502.158	6697.261	0.04575	5.555
1	10	1	1,10,1	6523.799	4838.783	0.02687	4.377
4	10	1	4,10,1	6245.870	4561.643	0.02516	4.251
8	10	1	8,10,1	6354.512	4697.402	0.02608	4.455
16	10	1	16,10,1	6421.354	4781.975	0.02701	4.899
32	10	1	32,10,1	6582.429	4972.353	0.02892	5.613
1	50	1	1,50,1	6021.628	4441.591	0.02390	4.095
4	50	1	4,50,1	6283.493	4688.289	0.02623	4.402
8	50	1	8,50,1	6111.695	4547.374	0.02524	4.406
16	50	1	16,50,1	6586.458	5194.036	0.03156	4.840
32	50	1	32,50,1	7269.405	5916.334	0.03710	5.588
1	1	10	1,1,10	6092.491	4490.291	0.02506	5.778
4	1	10	4,1,10	6000.176	4367.495	0.02343	7.369
8	1	10	8,1,10	5998.643	4386.663	0.02386	10.179
16	1	10	16,1,10	6051.919	4443.976	0.02454	13.049
32	1	10	32,1,10	6142.847	4526.946	0.02553	17.963
1	10	10	1,10,10	5835.602	4241.175	0.02260	5.793
4	10	10	4,10,10	**5711.161**	**4054.292**	**0.02137**	**7.177**
8	10	10	8,10,10	5686.112	4152.902	0.02245	8.916
16	10	10	16,10,10	5930.762	4382.871	0.02412	12.436
32	10	10	32,10,10	6197.371	4600.675	0.02617	18.303
1	50	10	1,50,10	6086.476	4516.026	0.02532	6.472
4	50	10	4,50,10	5911.804	4246.990	0.02273	7.930
8	50	10	8,50,10	5955.428	4412.038	0.02449	9.737
16	50	10	16,50,10	6069.447	4614.068	0.02698	13.011
32	50	10	32,50,10	6583.370	5094.305	0.02989	18.922
1	1	100	1,1,100	6002.425	4432.743	0.02472	24.350
4	1	100	4,1,100	5847.244	4245.517	0.02287	36.942
8	1	100	8,1,100	5803.888	4220.450	0.02292	53.517
16	1	100	16,1,100	5792.359	4184.402	0.02232	85.802
32	1	100	32,1,100	6061.722	4414.835	0.02414	145.852
1	10	100	1,10,100	5771.389	4203.303	0.02283	24.362
4	10	100	4,10,100	5902.660	4208.705	0.02266	37.626
8	10	100	8,10,100	5900.848	4314.305	0.02350	55.971
16	10	100	16,10,100	6089.943	4505.597	0.02484	89.621
32	10	100	32,10,100	6423.240	4710.539	0.02543	158.550
1	50	100	1,50,100	5777.194	4255.769	0.02339	25.056
4	50	100	4,50,100	5969.873	4340.069	0.02428	39.825
8	50	100	8,50,100	6346.355	4729.042	0.02667	55.836
16	50	100	16,50,100	6344.973	4818.684	0.02761	89.855
32	50	100	32,50,100	6333.144	4787.140	0.02726	153.253

Table A.2. Second group - RNN results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	8264.423	6198.696	0.03628	4.444
4	1	1	4,1,1	7466.769	5548.018	0.03223	4.488
8	1	1	8,1,1	7817.215	5897.032	0.03493	5.066
16	1	1	16,1,1	8330.440	6344.814	0.04002	5.806
32	1	1	32,1,1	7735.334	5943.193	0.03821	7.533
1	10	1	1,10,1	6397.451	4687.231	0.02511	4.543
4	10	1	4,10,1	6315.344	4637.096	0.02564	4.561
8	10	1	8,10,1	6305.934	4672.947	0.02599	5.101
16	10	1	16,10,1	6445.454	4842.255	0.02741	5.780
32	10	1	32,10,1	6438.671	4888.691	0.02858	7.291
1	50	1	1,50,1	7310.982	5823.423	0.03626	4.300
4	50	1	4,50,1	6819.065	5294.410	0.03207	4.566
8	50	1	8,50,1	7044.288	5546.835	0.03449	4.934
16	50	1	16,50,1	7748.800	6430.560	0.04272	5.751
32	50	1	32,50,1	7480.378	6125.640	0.03914	7.167
1	1	10	1,1,10	6126.284	4524.729	0.02560	7.650
4	1	10	4,1,10	5981.849	4349.155	0.02331	10.520
8	1	10	8,1,10	5973.884	4371.984	0.02382	13.910
16	1	10	16,1,10	5975.165	4371.917	0.02398	21.010
32	1	10	32,1,10	6102.142	4486.834	0.02504	33.442
1	10	10	1,10,10	6144.888	4450.322	0.02431	8.193
4	10	10	4,10,10	5970.575	4177.205	0.02179	11.366
8	10	10	8,10,10	5866.308	4212.578	0.02237	14.408
16	10	10	16,10,10	6211.495	4650.978	0.02623	21.456
32	10	10	32,10,10	6359.569	4882.864	0.02941	35.186
1	50	10	1,50,10	6272.191	4632.629	0.02563	7.876
4	50	10	4,50,10	5980.826	4243.003	0.02244	10.940
8	50	10	8,50,10	6048.965	4375.544	0.02398	14.886
16	50	10	16,50,10	7049.940	5532.115	0.03337	21.298
32	50	10	32,50,10	6899.477	5497.488	0.03322	35.358
1	1	100	1,1,100	6061.380	4498.280	0.02566	43.547
4	1	100	4,1,100	5818.858	4195.087	0.02193	71.291
8	1	100	8,1,100	5797.595	4195.585	0.02223	104.282
16	1	100	16,1,100	**5728.889**	**4126.839**	**0.02184**	**172.208**
32	1	100	32,1,100	6135.245	4500.233	0.02490	295.226
1	10	100	1,10,100	6116.857	4523.705	0.02571	43.426
4	10	100	4,10,100	6040.680	4155.594	0.02132	70.466
8	10	100	8,10,100	5953.377	4153.981	0.02154	105.968
16	10	100	16,10,100	5992.731	4422.035	0.02428	178.091
32	10	100	32,10,100	6270.852	4643.521	0.02637	307.073
1	50	100	1,50,100	6129.236	4581.464	0.02645	44.117
4	50	100	4,50,100	5938.367	4207.977	0.02211	72.367
8	50	100	8,50,100	6537.277	4763.506	0.02620	106.444
16	50	100	16,50,100	6196.209	4692.807	0.02710	179.049
32	50	100	32,50,100	6644.541	5165.368	0.03050	312.755

Table A.3. Third group - RNN results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	7194.319	5331.976	0.03055	4.668
4	1	1	4,1,1	6963.530	5128.606	0.02875	4.873
8	1	1	8,1,1	7026.252	5221.889	0.02969	5.475
16	1	1	16,1,1	7214.087	5433.772	0.03194	6.811
32	1	1	32,1,1	7253.621	5567.343	0.03588	8.976
1	10	1	1,10,1	6308.709	4605.106	0.02508	4.725
4	10	1	4,10,1	6088.770	4402.207	0.02397	5.048
8	10	1	8,10,1	6169.332	4523.705	0.02481	5.452
16	10	1	16,10,1	6381.347	4804.183	0.02733	6.855
32	10	1	32,10,1	6401.480	4881.550	0.02824	9.162
1	50	1	1,50,1	7885.471	6371.299	0.04007	4.471
4	50	1	4,50,1	6206.752	4596.026	0.02591	5.057
8	50	1	8,50,1	6556.461	4970.793	0.02923	5.494
16	50	1	16,50,1	7564.609	6176.705	0.04009	6.593
32	50	1	32,50,1	7481.168	6140.377	0.03910	8.709
1	1	10	1,1,10	6100.248	4505.734	0.02556	9.576
4	1	10	4,1,10	5918.521	4288.998	0.02277	13.833
8	1	10	8,1,10	5886.132	4275.692	0.02293	18.791
16	1	10	16,1,10	5916.945	4310.722	0.02341	29.035
32	1	10	32,1,10	6089.722	4485.436	0.02503	48.671
1	10	10	1,10,10	6110.475	4405.764	0.02390	9.709
4	10	10	4,10,10	5971.927	4138.098	0.02134	13.888
8	10	10	8,10,10	5810.695	4137.337	0.02183	19.777
16	10	10	16,10,10	6088.359	4531.125	0.02542	31.360
32	10	10	32,10,10	6392.863	4930.141	0.03027	51.752
1	50	10	1,50,10	6131.799	4504.953	0.02482	9.734
4	50	10	4,50,10	6062.011	4340.094	0.02322	15.465
8	50	10	8,50,10	5991.916	4345.938	0.02394	22.341
16	50	10	16,50,10	6569.367	5059.891	0.02976	31.518
32	50	10	32,50,10	7055.334	5672.917	0.03461	51.265
1	1	100	1,1,100	6032.104	4477.264	0.02544	63.459
4	1	100	4,1,100	5813.156	4185.606	0.02179	103.505
8	1	100	8,1,100	5731.945	4122.351	0.02151	152.779
16	1	100	16,1,100	**5679.286**	**4070.981**	**0.02126**	**257.146**
32	1	100	32,1,100	6021.056	4398.973	0.02413	452.392
1	10	100	1,10,100	6131.135	4530.797	0.02569	64.706
4	10	100	4,10,100	6030.218	4150.092	0.02120	107.461
8	10	100	8,10,100	5846.307	4100.779	0.02130	159.554
16	10	100	16,10,100	5837.383	4290.233	0.02371	269.197
32	10	100	32,10,100	6163.707	4538.004	0.02554	473.384
1	50	100	1,50,100	6161.513	4616.692	0.02664	62.573
4	50	100	4,50,100	5899.451	4122.769	0.02136	104.873
8	50	100	8,50,100	6273.308	4588.548	0.02508	157.796
16	50	100	16,50,100	6037.334	4536.079	0.02564	277.025
32	50	100	32,50,100	6775.861	5332.925	0.03192	472.039

SIMULATION RESULTS FOR NEURNAL LSTM NETWORK

Table A.4. First group - LSTM results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	6278.625	4616.917	0.02600	4.852
4	1	1	4,1,1	6246.828	4582.252	0.02600	4.935
8	1	1	8,1,1	6457.482	4780.564	0.02800	4.832
16	1	1	16,1,1	6393.788	4741.358	0.02800	4.816
32	1	1	32,1,1	6277.409	4640.037	0.02719	4.962
1	10	1	1,10,1	5915.114	4282.088	0.02301	4.907
4	10	1	4,10,1	5815.973	4202.451	0.02212	4.865
8	10	1	8,10,1	5809.749	4209.799	0.02226	4.883
16	10	1	16,10,1	5839.847	4223.117	0.02250	4.905
32	10	1	32,10,1	6021.453	4389.524	0.02390	4.884
1	50	1	1,50,1	5738.843	4118.099	0.02163	4.914
4	50	1	4,50,1	5798.812	4206.891	0.02219	4.970
8	50	1	8,50,1	5696.249	4101.376	0.02121	5.104
16	50	1	16,50,1	5756.111	4132.511	0.02157	4.948
32	50	1	32,50,1	6055.832	4477.512	0.02500	4.944
1	1	10	1,1,10	6030.275	4436.444	0.02458	7.478
4	1	10	4,1,10	5816.714	4187.694	0.02180	7.562
8	1	10	8,1,10	5768.011	4161.317	0.02180	7.429
16	1	10	16,1,10	5884.758	4267.433	0.02294	7.745
32	1	10	32,1,10	6059.172	4418.967	0.02431	8.007
1	10	10	1,10,10	5597.255	3957.924	0.02024	7.737
4	10	10	4,10,10	5690.536	4058.700	0.02081	7.769
8	10	10	8,10,10	5604.793	3991.098	0.02023	7.828
16	10	10	16,10,10	5701.377	4051.952	0.02074	7.878
32	10	10	32,10,10	5937.894	4302.242	0.02291	8.109
1	50	10	1,50,10	5720.684	4006.395	0.02048	7.571
4	50	10	4,50,10	5767.160	4167.126	0.02173	7.714
8	50	10	8,50,10	5792.853	4123.933	0.02082	7.727
16	50	10	16,50,10	5763.336	4125.696	0.02147	8.213
32	50	10	32,50,10	6008.060	4386.517	0.02384	8.988
1	1	100	1,1,100	5989.132	4447.379	0.02493	38.309
4	1	100	4,1,100	5622.655	3979.365	0.02022	35.318
8	1	100	8,1,100	**5573.399**	**3961.516**	**0.01959**	**35.745**
16	1	100	16,1,100	5601.727	3967.866	0.02032	36.849
32	1	100	32,1,100	5946.213	4228.376	0.02196	38.831
1	10	100	1,10,100	5673.150	3989.207	0.0202	36.235
4	10	100	4,10,100	5713.276	4160.416	0.0220	36.890
8	10	100	8,10,100	5927.279	4178.253	0.0212	37.349
16	10	100	16,10,100	5922.645	4207.654	0.0215	38.728
32	10	100	32,10,100	6101.376	4347.116	0.0222	40.124
1	50	100	1,50,100	6599.346	4767.674	0.0270	35.798
4	50	100	4,50,100	6249.300	4521.593	0.0237	36.638
8	50	100	8,50,100	6909.840	4820.470	0.0243	37.081
16	50	100	16,50,100	6576.371	4766.463	0.0242	38.136
32	50	100	32,50,100	6366.802	4555.314	0.0230	40.388

Table A.5. Second group - LSTM results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	6242.708	4580.582	0.0258	5.149
4	1	1	4,1,1	6124.999	4466.070	0.0246	5.116
8	1	1	8,1,1	6132.678	4491.354	0.0250	5.157
16	1	1	16,1,1	6088.017	4468.417	0.0252	5.232
32	1	1	32,1,1	6189.000	4594.940	0.0268	5.327
1	10	1	1,10,1	5908.768	4246.514	0.0224	5.073
4	10	1	4,10,1	5788.395	4169.099	0.0217	5.136
8	10	1	8,10,1	5738.395	4145.350	0.0216	5.195
16	10	1	16,10,1	5777.050	4161.851	0.0219	5.305
32	10	1	32,10,1	5995.695	4383.680	0.0238	5.377
1	50	1	1,50,1	5723.640	4072.236	0.0210	5.155
4	50	1	4,50,1	5827.845	4244.855	0.0223	5.211
8	50	1	8,50,1	5723.338	4143.657	0.0215	5.176
16	50	1	16,50,1	5776.457	4168.793	0.0219	5.440
32	50	1	32,50,1	5972.842	4353.326	0.0234	5.942
1	1	10	1,1,10	6140.694	4537.688	0.0258	11.417
4	1	10	4,1,10	5849.655	4220.092	0.0221	11.717
8	1	10	8,1,10	5757.818	4156.135	0.0218	10.545
16	1	10	16,1,10	5815.280	4200.822	0.0223	10.956
32	1	10	32,1,10	6030.587	4404.127	0.0241	11.575
1	10	10	1,10,10	5813.022	4128.869	0.0215	10.684
4	10	10	4,10,10	5758.686	4134.566	0.0213	10.916
8	10	10	8,10,10	5627.983	4025.243	0.0205	11.118
16	10	10	16,10,10	5767.064	4126.484	0.0215	11.515
32	10	10	32,10,10	5826.665	4313.961	0.0243	12.103
1	50	10	1,50,10	5995.720	4174.210	0.0217	10.763
4	50	10	4,50,10	5926.611	4189.583	0.0217	10.923
8	50	10	8,50,10	5734.521	4071.088	0.0207	11.165
16	50	10	16,50,10	5843.860	4242.921	0.0225	11.251
32	50	10	32,50,10	6037.831	4546.040	0.0263	11.966
1	1	100	1,1,100	6073.303	4521.338	0.0258	62.194
4	1	100	4,1,100	5666.535	4016.597	0.0203	64.102
8	1	100	8,1,100	**5581.399**	**3947.681**	**0.0199**	**66.765**
16	1	100	16,1,100	5590.626	3958.830	0.0201	69.435
32	1	100	32,1,100	5952.715	4293.704	0.0230	76.126
1	10	100	1,10,100	6016.432	4256.494	0.0219	66.919
4	10	100	4,10,100	6000.570	4092.247	0.0205	72.178
8	10	100	8,10,100	6070.580	4197.389	0.0208	70.396
16	10	100	16,10,100	5829.366	4184.102	0.0214	74.220
32	10	100	32,10,100	5705.844	4039.341	0.0207	79.664
1	50	100	1,50,100	6284.524	4439.835	0.0233	66.763
4	50	100	4,50,100	6357.275	4349.593	0.0217	68.606
8	50	100	8,50,100	7075.479	4854.955	0.0239	69.805
16	50	100	16,50,100	6460.692	4627.694	0.0237	73.318
32	50	100	32,50,100	6104.232	4377.700	0.0228	79.177

Table A.6. Third group - LSTM results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	6161.156	4508.858	0.0249	5.291
4	1	1	4,1,1	6109.359	4472.690	0.0247	5.417
8	1	1	8,1,1	6124.661	4499.495	0.0250	5.471
16	1	1	16,1,1	6040.620	4431.244	0.0247	5.635
32	1	1	32,1,1	6145.139	4562.047	0.0262	5.712
1	10	1	1,10,1	5945.197	4300.941	0.0231	5.366
4	10	1	4,10,1	5807.818	4198.970	0.0220	5.406
8	10	1	8,10,1	5730.962	4140.903	0.0216	5.472
16	10	1	16,10,1	5799.240	4189.905	0.0221	5.483
32	10	1	32,10,1	6085.750	4539.235	0.0258	5.648
1	50	1	1,50,1	5774.096	4128.657	0.0215	5.379
4	50	1	4,50,1	5869.819	4300.171	0.0230	5.378
8	50	1	8,50,1	5741.143	4170.777	0.0219	5.504
16	50	1	16,50,1	5832.070	4235.896	0.0225	5.591
32	50	1	32,50,1	6030.012	4468.232	0.0248	5.786
1	1	10	1,1,10	6112.032	4520.958	0.0257	13.301
4	1	10	4,1,10	5775.796	4125.667	0.0210	13.422
8	1	10	8,1,10	5661.056	4047.893	0.0206	13.643
16	1	10	16,1,10	5751.102	4130.992	0.0217	14.472
32	1	10	32,1,10	6031.618	4416.048	0.0242	15.356
1	10	10	1,10,10	5806.067	4109.838	0.0212	13.757
4	10	10	4,10,10	5764.339	4122.760	0.0211	13.959
8	10	10	8,10,10	5686.531	4042.560	0.0205	14.392
16	10	10	16,10,10	5690.439	4050.731	0.0207	14.956
32	10	10	32,10,10	5615.942	4088.563	0.0222	16.079
1	50	10	1,50,10	6079.735	4174.435	0.0216	14.411
4	50	10	4,50,10	5751.876	4016.660	0.0208	15.333
8	50	10	8,50,10	5735.563	4043.623	0.0205	14.448
16	50	10	16,50,10	5764.435	4171.048	0.0219	14.931
32	50	10	32,50,10	5924.575	4438.517	0.0255	16.498
1	1	100	1,1,100	6073.468	4511.421	0.0256	93.922
4	1	100	4,1,100	5667.515	4012.328	0.0203	96.341
8	1	100	8,1,100	**5585.884**	**3950.845**	**0.0196**	**103.195**
16	1	100	16,1,100	5591.259	3960.110	0.0200	106.520
32	1	100	32,1,100	5869.387	4198.889	0.0221	116.640
1	10	100	1,10,100	5804.391	4168.364	0.0224	96.799
4	10	100	4,10,100	6022.752	4090.603	0.0204	99.622
8	10	100	8,10,100	6208.955	4289.021	0.0213	104.550
16	10	100	16,10,100	5744.344	4109.157	0.0210	112.981
32	10	100	32,10,100	5753.072	4090.430	0.0211	123.130
1	50	100	1,50,100	5980.236	4260.675	0.0228	97.283
4	50	100	4,50,100	6398.844	4377.032	0.0218	101.800
8	50	100	8,50,100	7001.159	4859.779	0.0243	104.162
16	50	100	16,50,100	6542.472	4737.485	0.0248	106.592
32	50	100	32,50,100	6057.119	4378.193	0.0236	119.411

SIMULATION RESULTS FOR NEURNAL GRU NETWORK

Table A.7. First group - GRU results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	6569.771	4855.293	0.02812	4.743
4	1	1	4,1,1	6615.609	4879.668	0.02839	4.755
8	1	1	8,1,1	6468.121	4774.461	0.02753	4.770
16	1	1	16,1,1	6381.878	4732.238	0.02775	4.928
32	1	1	32,1,1	6524.250	4895.939	0.03058	5.021
1	10	1	1,10,1	5969.190	4369.032	0.02413	4.730
4	10	1	4,10,1	5918.853	4303.231	0.02300	4.767
8	10	1	8,10,1	5941.580	4343.006	0.02351	4.819
16	10	1	16,10,1	5948.027	4334.812	0.02359	4.864
32	10	1	32,10,1	6052.370	4442.710	0.02455	4.915
1	50	1	1,50,1	5726.762	4159.749	0.02233	4.669
4	50	1	4,50,1	5835.018	4252.360	0.02256	4.714
8	50	1	8,50,1	5741.617	4171.770	0.02190	4.778
16	50	1	16,50,1	5900.426	4308.588	0.02321	4.876
32	50	1	32,50,1	6040.121	4468.919	0.02497	4.910
1	1	10	1,1,10	6007.400	4405.882	0.02433	7.174
4	1	10	4,1,10	5890.667	4264.852	0.02244	7.276
8	1	10	8,1,10	5836.200	4239.890	0.02254	7.353
16	1	10	16,1,10	5922.002	4306.030	0.02335	7.547
32	1	10	32,1,10	6086.061	4460.794	0.02489	7.746
1	10	10	1,10,10	5616.065	3983.146	0.02040	7.273
4	10	10	4,10,10	5715.431	4077.131	0.02059	7.351
8	10	10	8,10,10	5629.239	4018.160	0.02031	7.465
16	10	10	16,10,10	5760.788	4118.081	0.02136	7.624
32	10	10	32,10,10	6016.407	4400.741	0.02433	7.847
1	50	10	1,50,10	5693.598	4066.125	0.02132	7.272
4	50	10	4,50,10	6002.166	4280.342	0.02339	7.374
8	50	10	8,50,10	5831.738	4168.453	0.02109	7.474
16	50	10	16,50,10	5827.276	4187.464	0.02195	7.623
32	50	10	32,50,10	6052.259	4443.811	0.02485	7.930
1	1	100	1,1,100	6009.450	4449.406	0.02482	32.672
4	1	100	4,1,100	**5612.749**	**3953.799**	**0.01970**	**34.093**
8	1	100	8,1,100	5634.153	3970.874	0.01970	34.641
16	1	100	16,1,100	5637.084	3988.363	0.01994	35.598
32	1	100	32,1,100	5929.482	4224.268	0.02204	36.835
1	10	100	1,10,100	5761.358	4019.238	0.02043	34.079
4	10	100	4,10,100	5761.818	4085.790	0.02178	34.734
8	10	100	8,10,100	5923.270	4203.806	0.02125	35.865
16	10	100	16,10,100	5965.551	4189.438	0.02143	37.764
32	10	100	32,10,100	5896.241	4186.021	0.02129	37.481
1	50	100	1,50,100	6080.313	4421.152	0.02436	32.873
4	50	100	4,50,100	6326.006	4519.644	0.02345	34.110
8	50	100	8,50,100	6839.716	4897.951	0.02472	34.035
16	50	100	16,50,100	7199.972	5273.600	0.02659	35.464
32	50	100	32,50,100	6320.111	4615.995	0.02449	39.277

Table A.8. Second group - GRU results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameter Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	6360.410	4684.523	0.02635	5.091
4	1	1	4,1,1	6303.501	4608.186	0.02561	4.996
8	1	1	8,1,1	6189.367	4558.193	0.02556	4.901
16	1	1	16,1,1	6332.833	4689.390	0.02723	5.051
32	1	1	32,1,1	6304.758	4721.360	0.02835	5.490
1	10	1	1,10,1	5867.339	4267.535	0.02309	5.115
4	10	1	4,10,1	5852.714	4244.746	0.02237	4.862
8	10	1	8,10,1	5765.053	4184.822	0.02206	4.909
16	10	1	16,10,1	5908.953	4306.048	0.02328	4.946
32	10	1	32,10,1	6049.816	4467.086	0.02490	5.202
1	50	1	1,50,1	5866.334	4271.599	0.02304	4.915
4	50	1	4,50,1	5838.039	4267.848	0.02256	4.966
8	50	1	8,50,1	5765.330	4204.988	0.02215	5.232
16	50	1	16,50,1	5935.866	4368.570	0.02359	5.269
32	50	1	32,50,1	5999.229	4426.770	0.02420	5.329
1	1	10	1,1,10	6148.208	4535.183	0.02581	9.784
4	1	10	4,1,10	5866.668	4236.843	0.02217	10.357
8	1	10	8,1,10	5789.346	4193.518	0.02211	10.663
16	1	10	16,1,10	5858.335	4248.431	0.02282	11.038
32	1	10	32,1,10	6049.794	4432.880	0.02453	11.551
1	10	10	1,10,10	5818.687	4195.365	0.02242	10.326
4	10	10	4,10,10	5906.268	4146.437	0.02116	10.589
8	10	10	8,10,10	5640.153	4025.283	0.02046	10.571
16	10	10	16,10,10	5813.864	4186.414	0.02194	10.856
32	10	10	32,10,10	6184.696	4690.328	0.02857	11.720
1	50	10	1,50,10	5737.576	4175.129	0.02260	10.102
4	50	10	4,50,10	5929.785	4086.182	0.02103	10.253
8	50	10	8,50,10	5780.716	4124.516	0.02157	10.369
16	50	10	16,50,10	5904.450	4336.681	0.02326	10.687
32	50	10	32,50,10	6108.307	4608.849	0.02714	11.321
1	1	100	1,1,100	6073.434	4553.358	0.02636	59.597
4	1	100	4,1,100	5663.787	4003.391	0.02007	60.554
8	1	100	8,1,100	**5600.504**	**3972.234**	**0.01962**	**66.179**
16	1	100	16,1,100	5613.535	3977.132	0.01991	65.991
32	1	100	32,1,100	5932.439	4291.394	0.02325	71.698
1	10	100	1,10,100	6016.253	4346.663	0.02439	62.912
4	10	100	4,10,100	5987.468	4091.271	0.02039	64.926
8	10	100	8,10,100	6207.939	4278.759	0.02146	68.696
16	10	100	16,10,100	5860.762	4236.582	0.02151	72.864
32	10	100	32,10,100	5744.926	4090.100	0.02088	77.632
1	50	100	1,50,100	6210.329	4623.366	0.02722	61.279
4	50	100	4,50,100	6281.798	4326.437	0.02155	62.613
8	50	100	8,50,100	7114.088	5058.448	0.02531	65.951
16	50	100	16,50,100	6889.954	4996.702	0.02617	69.129
32	50	100	32,50,100	6352.796	4601.297	0.02446	73.971

Table A.9. Third group - GRU results

Time-step (Lags)	Number Neurons	Epochs	Hyper-parameters Setting	RMSE	MAE	MAPE	Lapsed Time [s]
1	1	1	1,1,1	6292.901	4625.978	0.02596	4.983
4	1	1	4,1,1	6361.407	4661.800	0.02604	4.962
8	1	1	8,1,1	6192.800	4557.082	0.02544	5.303
16	1	1	16,1,1	6202.509	4582.264	0.02627	5.346
32	1	1	32,1,1	6248.128	4663.599	0.02767	5.431
1	10	1	1,10,1	5900.884	4303.794	0.02343	5.142
4	10	1	4,10,1	5858.279	4256.796	0.02255	5.199
8	10	1	8,10,1	5753.003	4174.992	0.02198	5.316
16	10	1	16,10,1	5917.516	4322.414	0.02340	5.392
32	10	1	32,10,1	6120.331	4596.175	0.02654	5.605
1	50	1	1,50,1	6097.480	4467.955	0.02468	5.174
4	50	1	4,50,1	5885.619	4330.158	0.02334	5.252
8	50	1	8,50,1	5803.171	4244.146	0.02257	5.319
16	50	1	16,50,1	6044.986	4480.390	0.02471	5.238
32	50	1	32,50,1	6060.390	4545.008	0.02564	5.213
1	1	10	1,1,10	6164.286	4548.490	0.02592	11.887
4	1	10	4,1,10	5799.550	4158.502	0.02126	12.151
8	1	10	8,1,10	5692.001	4088.355	0.02100	12.682
16	1	10	16,1,10	5786.517	4170.085	0.02203	13.399
32	1	10	32,1,10	6030.681	4415.796	0.02435	14.205
1	10	10	1,10,10	5764.643	4136.643	0.02185	12.266
4	10	10	4,10,10	5843.914	4066.168	0.02090	12.443
8	10	10	8,10,10	5680.398	4008.220	0.02015	12.828
16	10	10	16,10,10	5789.711	4151.167	0.02144	13.526
32	10	10	32,10,10	6040.930	4522.583	0.02660	14.543
1	50	10	1,50,10	5739.662	4190.454	0.02291	12.495
4	50	10	4,50,10	5897.331	4074.475	0.02089	12.642
8	50	10	8,50,10	5789.226	4104.813	0.02134	12.979
16	50	10	16,50,10	5862.431	4296.989	0.02294	13.639
32	50	10	32,50,10	5891.884	4379.923	0.02481	14.654
1	1	100	1,1,100	6045.292	4510.236	0.02595	85.225
4	1	100	4,1,100	5648.052	3989.837	0.01997	88.006
8	1	100	8,1,100	**5600.595**	**3971.039**	**0.01962**	**89.822**
16	1	100	16,1,100	5616.484	3980.177	0.01994	95.403
32	1	100	32,1,100	5839.373	4195.324	0.02210	105.138
1	10	100	1,10,100	5927.587	4297.485	0.02408	94.793
4	10	100	4,10,100	6011.212	4098.466	0.02028	93.348
8	10	100	8,10,100	6294.265	4345.685	0.02167	99.651
16	10	100	16,10,100	5804.764	4182.763	0.02142	98.484
32	10	100	32,10,100	5747.472	4098.183	0.02100	108.213
1	50	100	1,50,100	6312.766	4671.989	0.02839	86.705
4	50	100	4,50,100	6268.669	4301.007	0.02143	90.225
8	50	100	8,50,100	7011.844	5015.805	0.02519	92.308
16	50	100	16,50,100	6797.988	4904.121	0.02541	98.080
32	50	100	32,50,100	6364.698	4669.818	0.02650	108.948

SIMULATION RESULTS FOR NEURNAL OS-ELM NETWORK

Table A.10. First group - OS-ELM

Number Neurons	Forgetting Factor	RMSE	MAE	MAPE	Lapsed Time [s]
10	0.9	9518.178	6344.956	0.03877	0.142
10	0.95	10447.018	7477.483	0.04325	0.067
10	0.99	20116.983	16061.938	0.08413	0.069
10	0.995	22149.009	17693.711	0.09213	0.069
10	1	24030.764	19198.389	0.09998	0.070
110	0.9	24773.798	15367.068	0.06576	0.113
110	0.95	11183.264	7400.749	0.03484	0.100
110	0.99	3815.085	2782.685	0.01810	0.099
110	0.995	4038.103	2938.963	0.01918	0.089
110	1	4694.241	3364.208	0.02149	0.093
210	0.9	13126.480	7256.976	0.03271	0.146
210	0.95	8287.700	5181.770	0.02434	0.156
210	0.99	3255.397	2380.911	0.01279	0.138
210	0.995	3027.727	2225.221	0.01215	0.143
210	1	3275.512	2326.732	0.01256	0.140
310	0.9	6814.641	4687.769	0.02342	0.243
310	0.95	5829.936	4149.298	0.02077	0.249
310	0.99	3220.672	2412.050	0.01318	0.250
310	0.995	2946.759	2210.344	0.01231	0.264
310	1	3071.738	2242.558	0.01230	0.322
410	0.9	4563.982	3457.625	0.01882	1.070
410	0.95	4336.068	3273.084	0.01761	1.128
410	0.99	2986.602	2245.612	0.01250	1.071
410	0.995	2782.776	2093.925	0.01168	1.147
410	1	**2886.329**	**2122.076**	**0.01154**	**1.111**
510	0.9	4565.021	3447.846	0.01880	1.816
510	0.95	4366.424	3308.021	0.01766	1.668
510	0.99	3065.389	2336.221	0.01301	1.659
510	0.995	2825.950	2146.006	0.01211	1.734
510	1	2856.735	2138.646	0.01190	1.714
610	0.9	4193.854	3156.977	0.01741	2.338
610	0.95	4095.412	3062.757	0.01663	2.370
610	0.99	3149.027	2367.706	0.01324	2.388
610	0.995	2894.098	2151.517	0.01229	2.490
610	1	2876.412	2090.328	0.01195	2.486
710	0.9	3826.541	2909.227	0.01638	3.358
710	0.95	3738.864	2818.195	0.01564	3.259
710	0.99	2997.537	2283.044	0.01285	3.342
710	0.995	2775.530	2119.636	0.01208	3.366
710	1	2751.764	2045.987	0.01165	3.279
810	0.9	3715.441	2937.893	0.01663	4.433
810	0.95	3579.276	2818.415	0.01579	4.392
810	0.99	2957.600	2318.680	0.01306	4.526
810	0.995	2741.812	2143.297	0.01224	4.370
810	1	2683.983	2036.018	0.01169	4.374
910	0.9	3592.576	2844.872	0.01615	5.813
910	0.95	3489.045	2761.651	0.01547	5.696
910	0.99	2946.158	2308.912	0.01294	5.703
910	0.995	2740.974	2136.257	0.01213	5.759
910	1	2661.935	2028.125	0.01155	5.700

Table A.11. First group - OS-ELM

Number Neurons	Forgetting Factor	RMSE	MAE	MAPE	Lapsed Time [s]
1010	0.9	3538.666	2778.493	0.01600	7.140
1010	0.95	3440.850	2701.221	0.01532	7.370
1010	0.99	2957.347	2315.113	0.01321	7.166
1010	0.995	2774.945	2161.927	0.01249	7.232
1010	1	2717.057	2082.360	0.01206	7.208
1110	0.9	3643.603	2829.937	0.01646	8.928
1110	0.95	3545.353	2742.221	0.01571	8.878
1110	0.99	3074.664	2355.257	0.01348	8.986
1110	0.995	2874.876	2201.640	0.01274	8.813
1110	1	2763.342	2088.075	0.01214	8.982
1210	0.9	3389.862	2663.211	0.01559	11.262
1210	0.95	3306.455	2585.616	0.01495	11.118
1210	0.99	2925.682	2265.692	0.01311	11.278
1210	0.995	2752.683	2145.790	0.01255	11.226
1210	1	2646.672	2049.718	0.01207	11.219
1310	0.9	3286.706	2561.644	0.01536	13.217
1310	0.95	3216.566	2507.593	0.01482	13.280
1310	0.99	2865.721	2247.599	0.01325	13.339
1310	0.995	2723.324	2143.885	0.01273	13.245
1310	1	2643.741	2048.163	0.01221	13.377
1410	0.9	3393.612	2625.812	0.01562	15.697
1410	0.95	3305.670	2558.466	0.01502	15.854
1410	0.99	2981.871	2309.858	0.01345	15.768
1410	0.995	2823.314	2194.610	0.01290	15.722
1410	1	2693.521	2090.383	0.01238	15.601
1510	0.9	3370.988	2645.770	0.01563	18.081
1510	0.95	3313.622	2580.004	0.01505	18.189
1510	0.99	3001.985	2336.505	0.01354	18.001
1510	0.995	2845.344	2229.373	0.01301	17.981
1510	1	2709.221	2129.918	0.01250	18.109
1610	0.9	3215.939	2534.384	0.01496	21.017
1610	0.95	3147.107	2474.343	0.01444	20.991
1610	0.99	2878.874	2251.807	0.01303	21.004
1610	0.995	2742.549	2146.220	0.01252	21.051
1610	1	2623.975	2047.366	0.01203	21.196
1710	0.9	3267.404	2573.922	0.01527	24.072
1710	0.95	3207.005	2528.353	0.01483	24.121
1710	0.99	2960.628	2329.307	0.01355	23.885
1710	0.995	2835.284	2228.045	0.01306	24.053
1710	1	2724.294	2134.799	0.01258	23.980
1810	0.9	3132.301	2504.491	0.01491	28.149
1810	0.95	3051.633	2435.082	0.01439	28.236
1810	0.99	2849.639	2268.773	0.01325	27.939
1810	0.995	2748.642	2181.278	0.01280	27.946
1810	1	2659.198	2093.724	0.01236	28.066
1910	0.9	3151.609	2489.225	0.01488	31.911
1910	0.95	3081.088	2428.907	0.01443	31.976
1910	0.99	2888.963	2269.098	0.01329	31.878
1910	0.995	2793.084	2189.906	0.01287	31.734
1910	1	2694.890	2107.548	0.01244	31.804

Table A.12. Second group - OS-ELM

Number Neurons	Forgetting Factor	RMSE	MAE	MAPE	Lapsed Time [s]
10	0.9	20117.256	9109.940	0.05642	0.091
10	0.95	13058.925	9341.422	0.06228	0.069
10	0.99	29173.025	21481.911	0.11620	0.067
10	0.995	34078.132	24857.005	0.13027	0.071
10	1	38499.311	27737.583	0.14283	0.070
110	0.9	37684.421	21316.569	0.08850	0.092
110	0.95	11077.969	7290.247	0.03247	0.091
110	0.99	3646.505	2719.539	0.01546	0.091
110	0.995	3802.878	2805.557	0.01617	0.094
110	1	4482.937	3248.657	0.01838	0.092
210	0.9	13475.129	7508.044	0.03411	0.158
210	0.95	8670.672	5624.273	0.02641	0.143
210	0.99	3314.602	2380.069	0.01342	0.153
210	0.995	3109.600	2274.129	0.01308	0.142
210	1	3506.822	2529.973	0.01414	0.204
310	0.9	5715.490	3728.667	0.01968	0.253
310	0.95	5148.772	3512.700	0.01828	0.252
310	0.99	3004.841	2265.511	0.01289	0.277
310	0.995	2796.760	2171.049	0.01245	0.266
310	1	3011.770	2309.079	0.01291	0.268
410	0.9	4425.352	3213.695	0.01778	1.058
410	0.95	4221.912	3037.816	0.01642	1.182
410	0.99	3108.086	2285.874	0.01273	1.094
410	0.995	**2849.514**	**2140.723**	**0.01211**	**1.142**
410	1	2858.322	2176.607	0.01217	1.142
510	0.9	3982.600	2939.566	0.01685	1.674
510	0.95	3887.684	2842.497	0.01593	1.779
510	0.99	3157.159	2347.349	0.01332	1.737
510	0.995	2918.107	2230.114	0.01274	1.912
510	1	2885.479	2196.272	0.01250	1.734
610	0.9	3730.220	2859.060	0.01641	2.374
610	0.95	3635.407	2754.626	0.01557	2.422
610	0.99	3044.922	2291.230	0.01327	2.429
610	0.995	2834.409	2177.701	0.01274	2.396
610	1	2804.704	2170.089	0.01262	2.405
710	0.9	3524.341	2735.240	0.01600	3.435
710	0.95	3450.040	2652.238	0.01525	3.268
710	0.99	3021.454	2298.983	0.01331	3.329
710	0.995	2820.213	2150.124	0.01269	3.292
710	1	2747.953	2139.596	0.01259	3.298
810	0.9	3512.667	2735.985	0.01595	4.537
810	0.95	3441.602	2666.664	0.01535	4.375
810	0.99	3048.632	2340.783	0.01360	4.392
810	0.995	2853.813	2226.214	0.01307	4.498
810	1	2750.845	2186.928	0.01281	4.385
910	0.9	3369.028	2645.914	0.01584	5.618
910	0.95	3304.476	2582.256	0.01519	5.789
910	0.99	2986.013	2326.393	0.01371	5.690
910	0.995	2838.166	2224.149	0.01323	5.714
910	1	2771.505	2196.174	0.01302	5.751

Table A.13. Second group - OS-ELM

Number Neurons	Forgetting Factor	RMSE	MAE	MAPE	Lapsed Time [s]
1010	0.9	3213.902	2485.934	0.01495	7.202
1010	0.95	3174.153	2446.635	0.01450	7.212
1010	0.99	2903.160	2247.321	0.01325	7.179
1010	0.995	2764.915	2159.697	0.01283	7.146
1010	1	2687.220	2134.519	0.01263	7.264
1110	0.9	3157.495	2486.606	0.01490	8.782
1110	0.95	3096.048	2441.669	0.01449	8.930
1110	0.99	2881.358	2285.601	0.01356	8.974
1110	0.995	2757.975	2195.704	0.01316	8.833
1110	1	2681.799	2166.867	0.01297	9.012
1210	0.9	3122.518	2468.755	0.01496	11.159
1210	0.95	3074.744	2431.464	0.01458	11.596
1210	0.99	2882.478	2281.962	0.01361	11.918
1210	0.995	2780.049	2202.703	0.01323	11.259
1210	1	2710.093	2177.818	0.01305	11.162
1310	0.9	3073.274	2413.782	0.01451	13.208
1310	0.95	3031.795	2382.368	0.01421	13.311
1310	0.99	2855.443	2241.310	0.01332	13.360
1310	0.995	2738.975	2148.520	0.01288	13.218
1310	1	2633.021	2080.787	0.01253	13.162
1410	0.9	3053.697	2441.372	0.01451	15.754
1410	0.95	3038.414	2422.547	0.01429	15.708
1410	0.99	2885.336	2287.570	0.01349	15.680
1410	0.995	2788.005	2214.275	0.01314	15.779
1410	1	2702.085	2161.732	0.01285	15.712
1510	0.9	2995.507	2302.195	0.01391	18.154
1510	0.95	2963.620	2288.220	0.01372	18.381
1510	0.99	2840.262	2187.672	0.01307	18.233
1510	0.995	2755.514	2128.816	0.01279	18.114
1510	1	2669.063	2092.205	0.01259	18.342
1610	0.9	2950.376	2328.141	0.01378	21.120
1610	0.95	2910.679	2300.299	0.01357	21.381
1610	0.99	2784.678	2191.986	0.01293	21.150
1610	0.995	2711.350	2130.812	0.01264	21.145
1610	1	2646.293	2078.112	0.01237	21.320
1710	0.9	2983.426	2348.267	0.01413	24.047
1710	0.95	2941.477	2319.911	0.01391	24.210
1710	0.99	2829.665	2230.983	0.01332	24.126
1710	0.995	2761.738	2179.401	0.01306	24.145
1710	1	2695.948	2131.668	0.01280	24.014
1810	0.9	2860.484	2302.973	0.01391	28.242
1810	0.95	2838.065	2286.009	0.01373	28.284
1810	0.99	2732.408	2188.892	0.01312	28.185
1810	0.995	2672.533	2141.838	0.01289	28.268
1810	1	2613.818	2106.573	0.01268	28.265
1910	0.9	2846.211	2261.756	0.01367	32.041
1910	0.95	2831.315	2244.945	0.01349	31.965
1910	0.99	2738.269	2165.189	0.01295	31.942
1910	0.995	2685.148	2123.049	0.01274	31.883
1910	1	2636.693	2097.742	0.01258	31.957

Table E.14. Third group - OS-ELM

Number Neurons	Forgetting Factor	RMSE	MAE	MAPE	Lapsed Time [s]
10	0.9	16339.629	9384.567	0.05783	0.092
10	0.95	14484.560	9956.305	0.06466	0.069
10	0.99	21753.823	16303.731	0.10193	0.070
10	0.995	24178.829	17857.327	0.11171	0.070
10	1	26369.795	19430.043	0.12224	0.072
110	0.9	47798.870	24185.199	0.10071	0.097
110	0.95	14008.613	8674.388	0.03883	0.093
110	0.99	4100.081	3062.899	0.01784	0.092
110	0.995	4307.946	3241.140	0.01904	0.098
110	1	5035.674	3741.690	0.02159	0.095
210	0.9	19954.726	8494.369	0.03693	0.174
210	0.95	9738.465	5566.033	0.02570	0.179
210	0.99	3572.369	2707.083	0.01480	0.155
210	0.995	3474.253	2632.742	0.01466	0.158
210	1	3835.781	2807.140	0.01559	0.167
310	0.9	6352.361	4294.393	0.02174	0.275
310	0.95	5633.419	3859.218	0.01961	0.265
310	0.99	3533.834	2589.914	0.01426	0.274
310	0.995	3260.704	2416.496	0.01362	0.257
310	1	3386.356	2472.499	0.01387	0.296
410	0.9	4587.048	3431.223	0.01882	1.140
410	0.95	4384.103	3276.136	0.01778	1.113
410	0.99	3278.790	2553.202	0.01451	1.127
410	0.995	3068.922	2361.303	0.01374	1.133
410	1	3156.913	2377.180	0.01375	1.142
510	0.9	4058.494	3150.569	0.01766	1.861
510	0.95	3931.416	3046.943	0.01691	1.760
510	0.99	3159.923	2502.659	0.01423	1.712
510	0.995	2953.041	2368.254	0.01362	1.732
510	1	2944.116	2333.071	0.01340	1.752
610	0.9	3596.982	2863.029	0.01619	2.428
610	0.95	3521.108	2790.580	0.01566	2.479
610	0.99	3065.820	2446.975	0.01389	2.437
610	0.995	2836.113	2268.224	0.01313	2.564
610	1	2762.903	2201.870	0.01277	2.407
710	0.9	3368.045	2651.728	0.01519	3.389
710	0.95	3316.643	2591.473	0.01472	3.330
710	0.99	2972.525	2340.077	0.01335	3.360
710	0.995	2789.908	2220.665	0.01283	3.497
710	1	**2712.284**	**2139.846**	**0.01244**	**3.321**
810	0.9	3520.609	2731.606	0.01536	4.518
810	0.95	3475.003	2686.539	0.01500	4.489
810	0.99	3122.810	2409.146	0.01363	4.583
810	0.995	2929.472	2276.847	0.01307	4.543
810	1	2799.360	2183.526	0.01266	4.472
910	0.9	3339.669	2640.449	0.01516	5.911
910	0.95	3288.807	2580.457	0.01468	5.711
910	0.99	3009.332	2338.746	0.01339	5.784
910	0.995	2839.323	2219.157	0.01286	5.874
910	1	2702.602	2113.756	0.01239	5.814

Table E.15. Third group - OS-ELM

Number Neurons	Forgetting Factor	RMSE	MAE	MAPE	Lapsed Time [s]
1010	0.9	3268.363	2638.530	0.01525	7.373
1010	0.95	3227.611	2599.060	0.01490	7.316
1010	0.99	2977.599	2392.777	0.01377	7.220
1010	0.995	2842.762	2292.936	0.01335	7.394
1010	1	2728.279	2197.906	0.01294	7.277
1110	0.9	3257.415	2566.175	0.01492	9.051
1110	0.95	3210.294	2521.505	0.01457	8.916
1110	0.99	2991.257	2332.108	0.01348	9.066
1110	0.995	2869.447	2238.199	0.01306	9.128
1110	1	2752.108	2155.685	0.01267	8.964
1210	0.9	3225.348	2492.428	0.01468	11.363
1210	0.95	3187.115	2465.834	0.01441	11.335
1210	0.99	3006.546	2325.932	0.01355	11.209
1210	0.995	2890.572	2242.303	0.01317	11.415
1210	1	2772.724	2164.397	0.01280	11.330
1310	0.9	3049.582	2401.745	0.01417	13.357
1310	0.95	3037.566	2392.662	0.01397	13.429
1310	0.99	2901.856	2270.661	0.01321	13.435
1310	0.995	2809.879	2207.526	0.01289	13.317
1310	1	2713.225	2141.247	0.01256	13.391
1410	0.9	3145.673	2494.660	0.01466	15.894
1410	0.95	3100.956	2455.043	0.01435	15.885
1410	0.99	2959.222	2334.995	0.01361	15.909
1410	0.995	2862.634	2271.171	0.01331	15.813
1410	1	2747.048	2195.263	0.01294	15.818
1510	0.9	2914.779	2304.487	0.01387	18.320
1510	0.95	2906.483	2293.301	0.01370	18.292
1510	0.99	2800.541	2199.187	0.01307	18.349
1510	0.995	2734.120	2151.809	0.01283	18.341
1510	1	2665.251	2106.224	0.01260	18.417
1610	0.9	3020.125	2430.698	0.01427	21.368
1610	0.95	2990.673	2390.516	0.01399	21.300
1610	0.99	2885.666	2293.988	0.01343	22.073
1610	0.995	2811.450	2237.254	0.01317	21.442
1610	1	2722.825	2174.215	0.01288	21.452
1710	0.9	2942.098	2343.208	0.01376	26.714
1710	0.95	2915.188	2307.354	0.01352	24.412
1710	0.99	2816.109	2215.167	0.01299	24.507
1710	0.995	2755.990	2170.564	0.01277	24.513
1710	1	2692.903	2118.451	0.01252	24.462
1810	0.9	2904.413	2297.851	0.01358	28.525
1810	0.95	2849.189	2241.468	0.01330	28.491
1810	0.99	2765.894	2173.994	0.01287	28.413
1810	0.995	2712.407	2143.923	0.01272	28.587
1810	1	2649.944	2103.028	0.01250	28.647
1910	0.9	2886.515	2269.565	0.01352	32.845
1910	0.95	2850.386	2240.994	0.01332	32.266
1910	0.99	2769.063	2168.933	0.01285	32.178
1910	0.995	2718.117	2133.532	0.01267	32.079
1910	1	2658.902	2091.701	0.01245	32.099